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Title HSTDV Nozzle Contour Optimization for Enhanced Force Characteristics – Phase I

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Abstract

The SERN shape for the DRDL HSTDV program is a straight 2-D ramp (18° angle). It is known that a higher nozzle exit angle introduces divergence losses which can be reduced by properly contouring the nozzle so as to keep the nozzle exit angle as small as possible.

Different nozzle design contour approaches were adopted. The force characteristics evaluated for each of these contours showed the 18 degree ramp to be better. The thrust optimized contour however resulted in a slight increase in C_T relative to the 18degree ramp. But the C_N value dropped significantly for this case.